



Aspectrics



# ***EP-IR Spectrograph***

***Installation Guide***

**&**

***User's Manual***

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Part Number: 002-0000

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# Aspectrics



## LIMITED WARRANTY

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## CUSTOMER SUPPORT

Telephone: 888.9ASPECT (888.927.7348)

E-mail: support@Aspectrics.com



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## Introduction

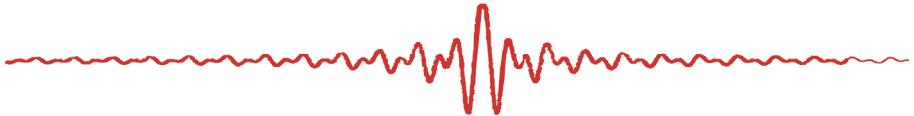
The Aspectrics Encoded Photometric Infrared Spectrograph (EP-IR) 100/200 Series is a compact, highly accurate, and flexible spectroscopic analyzer used in a variety of applications including the monitoring of ambient air and stack gases, engine emissions, foods, and semiconductor processes.

The Aspectrics' EP-IR design is simple yet rugged and efficient producing a compact yet extremely powerful unit. At the heart of the analyzer is a rotating disc onto which up to 256 concentric encoding tracks is formed. The encoding tracks enable extremely accurate intensity measurements and are sensitive enough to replace conventional detector arrays such as NDIR and FTIR currently used in many instruments. The EP-IR is designed to encode the analytical information in the same way that an interferometer does but without environmentally sensitive components. It records and stores data in binary form to provide high resolution data using minimal memory. The captured high-resolution data can be repeatedly reviewed using a wide variety of methodologies. The EP-IR allows Sample Tag insertion in the data record to safely store pertinent information of the sampling method within the data record.

This manual provides unpacking, installation, and initial operation instructions. Detailed operation instructions are application specific and are available from Aspectrics (for contact information, see Customer Support on *Page ii* of this document).

*Figure 1-1. Aspectrics EP-IR*





## Unpacking the EP-IR

The following description relates the procedure for unpacking the EP-IR instrument and the Sample Bench option—the common laboratory installation.

**NOTE: ALWAYS CHECK THE SHOCKWATCH LABEL ON THE SHIPPING BOX FOR A RED SHOCK INDICATION (SEE FIGURE 1-2). ACCEPT THE SHIPMENT BUT NOTE ON THE BILL OF LADING THE INDICATOR ACTIVATION AND INSPECT THE SHIPMENT CAREFULLY FOR DAMAGE. THEN CONTACT ASPECTRICS CUSTOMER SUPPORT**

Figure 1-2. Shockwatch Label.



Check the Packing List to verify all components are present.

Table 1-1. Typical EP-IR Equipment List (part numbers subject to change)

Item	Part Number	Description	Qty
EP-IR Instrument			
1	MIR-100-256	Aspectrics Inc. Spectrometer	1
2	002-0000	Aspectrics Users Manual	1
3	030-0000	Aspectrics Software CD	1
4	204-0004	Cable, Ethernet Category 5E	1
5	204-0005	Cable, Enhanced Category 5 568B Crossover	1
6	706-0000	Power Supply Brick for Instrument	1
Sample Bench			
1	704-0000-00	Development Bench, Single Beam	1
2	466-0002	Power Supply Brick for Sample Bench	1
3	601-0000	Hardware Kit Assembly	1

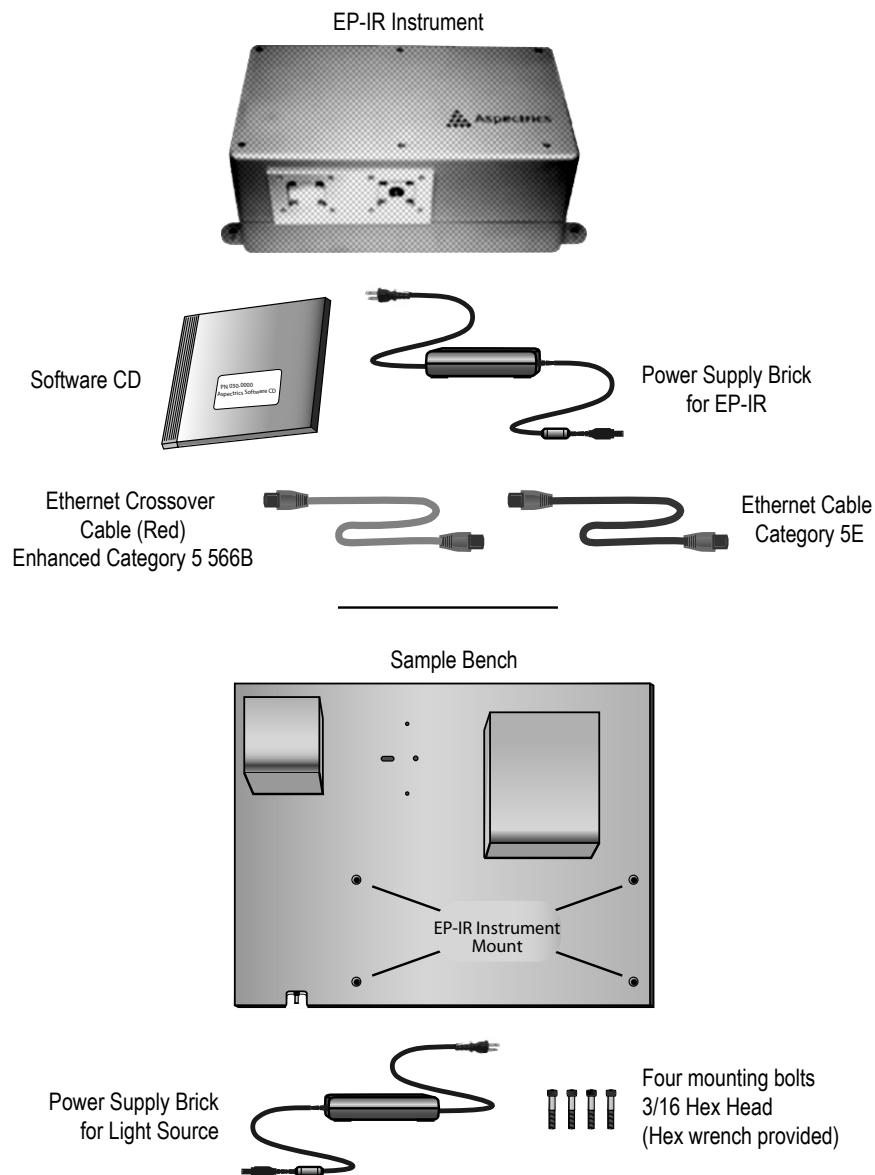


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Figure 3 depicts the equipment included in both the EP-IR Instrument shipment and the Sample Bench shipment.

Figure 1-3. EP-IR and Sample Bench Components





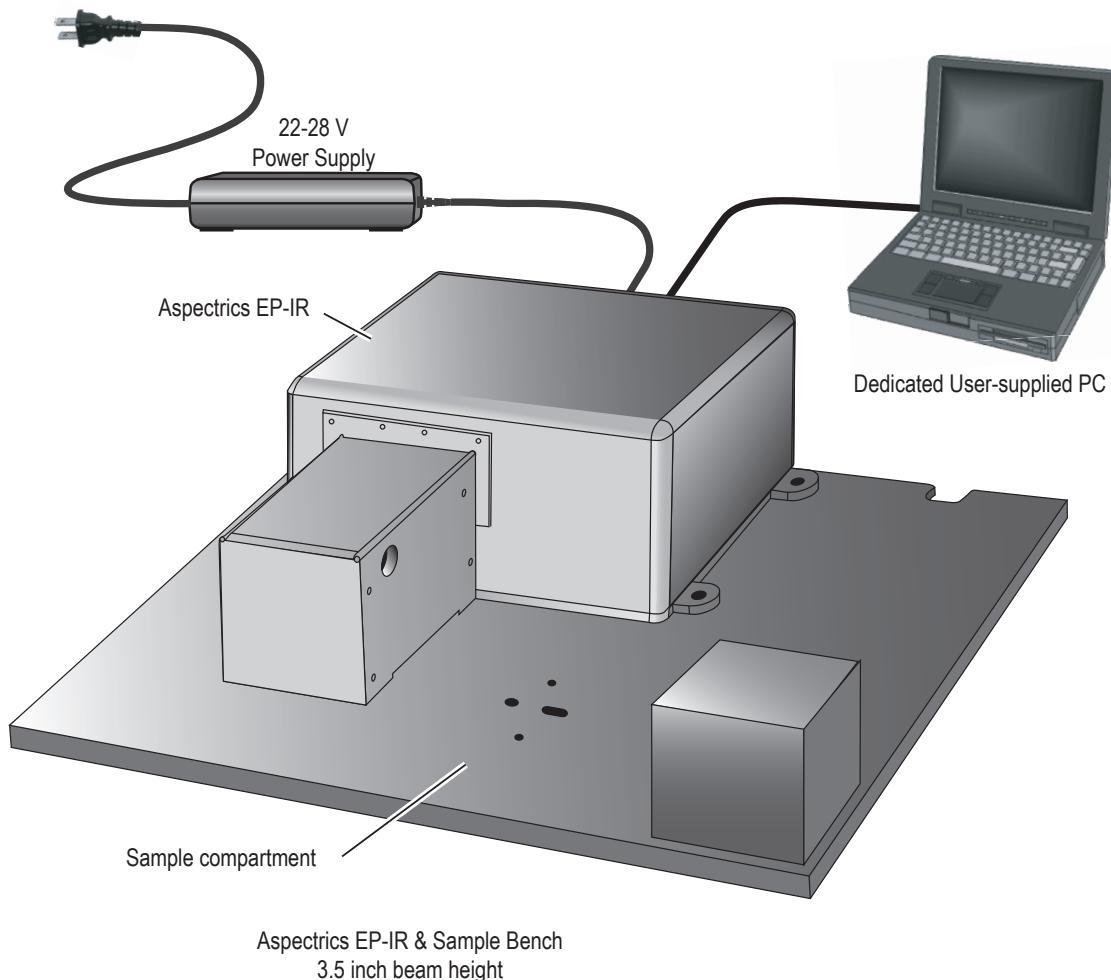
## Installation

Physical installation of the EP-IR is application specific and will not be covered here. For typical lab setup using the Sample Bench option, see **Section 3, Sample Bench Installation**. For Custom installations, Instrument alignment diagrams are provided at the end of this section.

The basic EP-IR system consists of the following items:

- The EP-IR 100 / 200 Series Spectrograph
- Brick power supply
- 10 ft. (3 meter) Category 5E Ethernet cable
- 10 ft. (3 meter) Red Ethernet crossover cable
- A user-supplied personal computer (minimum 1GHz) running Windows XP operating system

Figure 1-4. Typical EP-IR System with Sample Bench.





## Cabling the EP-IR

The following instructions describe cabling of the EP-IR for power-up and initial configuration. Included are PC requirements for operating the EP-IR on a Local Area Network (LAN). The cabling procedure includes:

- Connecting the PC via a cross-over Ethernet cable
- Connecting the brick power supply

## PC Requirements

Installation of the EP-IR requires a LAN dedicated PC running the Windows XP operating system.

The EP-IR also uses a spectral data collection software that requires JavaScript version 1.3 or greater is loaded on the PC. To check your version of Java Runtime Environment:

1. Open an MS-DOS C:\ prompt window.
2. At the C:>\ prompt, enter the text string <java -version>.
3. Press the <Enter> key.
4. A message reporting the Java version will be displayed

A screenshot of a Windows command prompt window titled 'C:\WINDOWS\system32\cmd.exe'. The window shows the command 'java -version' being run and its output: 'java version "1.5.0\_01"', 'Java(TM) 2 Runtime Environment, Standard Edition (build 1.5.0\_01-b08)', and 'Java HotSpot(TM) Client VM (build 1.5.0\_01-b08, mixed mode, sharing)'.

***NOTE: IF THE VERSION OF JAVA RUNTIME ENVIRONMENT ON THE PC IS  
1.3 OR OLDER, PLEASE PROCURE AND INSTALL AN UPDATED VERSION FROM  
<http://java.sun.com> BEFORE CONTINUING.***



## Cabling Procedure

Perform the following steps to cable the EP-IR:

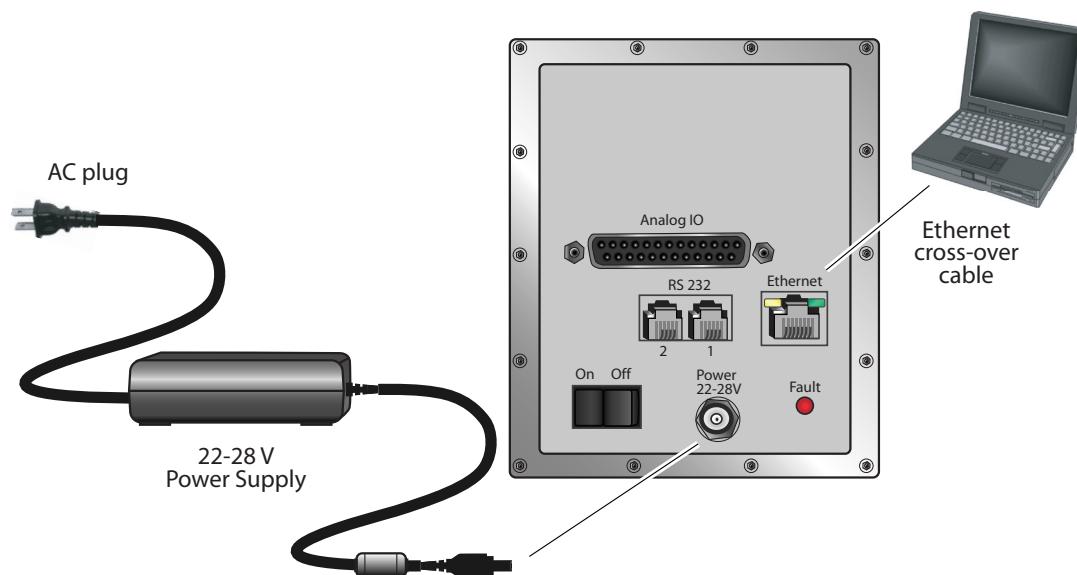
1. *Ensure that the PC is turned OFF.*
2. *Using the red cross-over Ethernet cable, connect the PC Ethernet to the EP-IR Ethernet port.*

Figure 1-5. EP-IR to PC Cabling



3. *Connect the DC side of the power supply brick to the 22-28V Power connector on the EP-IR and then plug in the AC side.*
5. *Turn on the PC and proceed to Configuring the PC.*

Figure 1-6. Input/Output and Power Connections





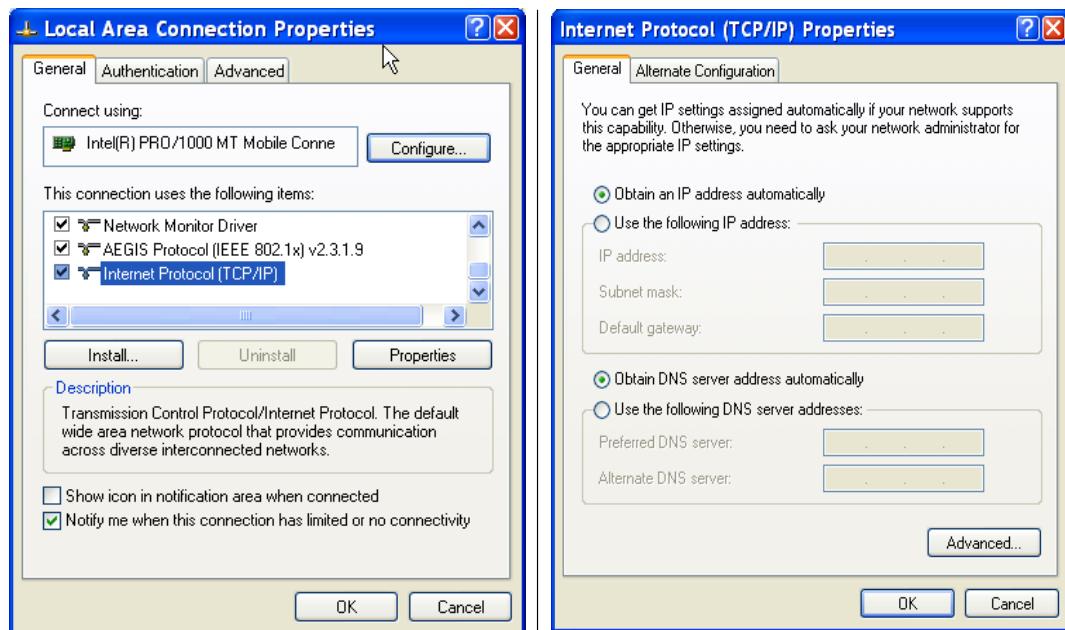
## Configuring the PC

The Aspectrics GUI enables communication with, and control of, the EP-IR. It is configurable spectral data collection software. The output spectral data can be saved for later chemometrics analysis using a specialized software package such as RTSS from Sanchez Industrial Design.

### Local Area Network (LAN) Setup

The dedicated host PC should be connected directly to the EP-IR via the red cross-over Ethernet cable. It should not be connected to a network. To set up the host PC, perform the following steps:

1. *On the PC Local Area Connection menu select Internet Protocol (TCP/IP) and click OK to bring up the Internet Protocol (TCP/IP) menu. Select "Obtain an IP address automatically."*





2. Bring up a command window and "Ping" the instrument at address 169.254.0.1.

```
C:\>ping 169.254.0.1

Pinging 169.254.0.1 with 32 bytes of data:
Reply from 169.254.0.1: bytes=32 time=6ms TTL=64
Reply from 169.254.0.1: bytes=32 time<1ms TTL=64
Reply from 169.254.0.1: bytes=32 time<1ms TTL=64
Reply from 169.254.0.1: bytes=32 time<1ms TTL=64

Ping statistics for 169.254.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 6ms, Average = 1ms

C:\>
```

3. If the Ping is successfully replied to, go to Step 4. If there are no replies, reset the network setting using these two commands:

- "ipconfig / release" followed by,
- "ipconfig / renew"

```
C:\>ping 169.254.0.1

Pinging 169.254.0.1 with 32 bytes of data:
Reply from 169.254.0.1: bytes=32 time=6ms TTL=64
Reply from 169.254.0.1: bytes=32 time<1ms TTL=64
Reply from 169.254.0.1: bytes=32 time<1ms TTL=64
Reply from 169.254.0.1: bytes=32 time<1ms TTL=64

Ping statistics for 169.254.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 6ms, Average = 1ms

C:\>
```



Note that the second command “ipconfig /renew” might take up to one minute and will result in an error message. This is expected because there is no DHCP server. The failure, however, will default to an IP address in the range of 169.254.X.X. Use the command “ipconfig” to verify this result.

The image shows two separate windows of a Windows Command Prompt (cmd.exe) running on a Windows operating system. Both windows have a blue title bar with 'C:\WINDOWS\system32\cmd.exe' and a white body.

**Top Window (Initial State):**

```
C:\>ipconfig /release
Windows IP Configuration
No operation can be performed on Bluetooth Network while it has its media disconnected.

Ethernet adapter Local Area Connection:
  Connection-specific DNS Suffix . . . .
  IP Address . . . . . : 0.0.0.0
  Subnet Mask . . . . . : 0.0.0.0
  Default Gateway . . . . . : 

Ethernet adapter Bluetooth Network:
  Media State . . . . . : Media disconnected

C:\>>
```

**Bottom Window (After ipconfig /renew):**

```
C:\>ipconfig /renew
Windows IP Configuration
An error occurred while renewing interface Local Area Connection : unable to contact your DHCP server. Request has timed out.
No operation can be performed on Bluetooth Network while it has its media disconnected.

C:\>ipconfig
Windows IP Configuration

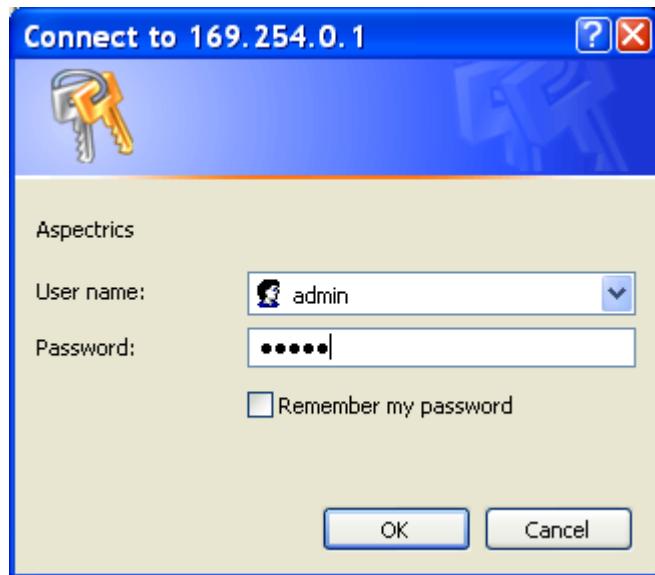
Ethernet adapter Local Area Connection:
  Connection-specific DNS Suffix . . .
  Autoconfiguration IP Address. . . . . : 169.254.5.104
  Subnet Mask . . . . . : 255.255.0.0
  Default Gateway . . . . . : 

Ethernet adapter Bluetooth Network:
  Media State . . . . . : Media disconnected

C:\>>
```



4. Connect to the EP-IR using the host PC Web Browser. Open Internet Explorer and browse to the URL <http://169.254.0.1>. The following login prompt will appear.



Enter:

*User name: admin*

*Password: admin*

*Click OK.*

A Security Warning prompt will ask for your permission to execute Aspectrics applets on your PC. Click YES to continue.





5. *Change the boot parameters. The initial screen you will see is similar to this screen shot:*

Power Supply Board		Controller		Pre-Amp 1		Detector Support 1	
Rev.	<input type="text" value="0"/>	Temp.	<input type="text"/>	Rev.	<input type="text" value="1"/>	Rev.	<input type="text" value="0"/>
Temp.	<input type="text" value="37 °C"/>	Voltages:	<input type="text"/> +1.8V +1.5V +3.3VP +2.5V +12V +3.3V	Type	<input type="text" value="1"/>	Type	<input type="text" value="2"/>
Voltages:	+6V -6V +12V -12V +5V -5V +13V +5V TEC		<input type="text"/> 5.875 V -5.938 V 11.875 V -11.813 V 4.922 V -4.870 V 12.661 V 4.896 V	Gain	<input type="text" value="8"/> ▾	TEC Temp.	<input type="text" value="-16.042 °C"/>
Fan Speed	<input type="text"/>	Fan Speed	<input type="text"/>	Pre-Amp 2	<input type="text"/>	HV Bias	<input type="text" value="113.947 V"/>
	<input type="button" value="Set"/>		<input type="button" value="Set"/>	Rev.	<input type="text"/>	<input type="button" value="Set"/>	
				Type	<input type="text"/>		
				Gain	<input type="text" value="1"/> ▾		
				TEC Temp.	<input type="text"/>		
				HV Bias	<input type="text"/>		
					<input type="button" value="Set"/>		
						<input type="button" value="Set"/>	

Click on the “Admin” top-bar tab to view the Boot Parameters.

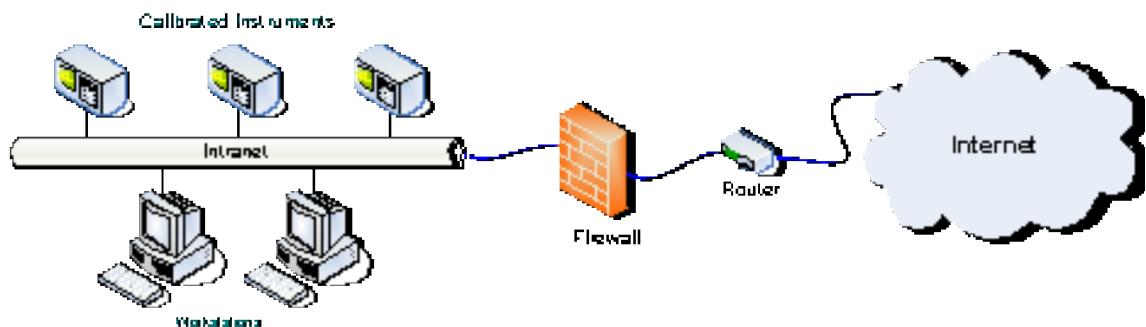
- Change the IP Address – this should be a unique IP address assigned to the instrument by your network administrator.



- Change the Host Address – this should be the host IP address of a PC from which the instrument will obtain its firmware upgrades. This field is optional.
- Change the Gateway (G/W address) to that assigned by your network administrator. This should be your corporate gateway. The Gateway IP address facilitates firmware upgrades directly from Aspectrics website.
- Click on Set Parameters then Reboot to restart your EP-IR.

6. *Connect the Aspectrics EP-IR to your corporate network. After successful configuration, your EP-IR is ready to be connected to the corporate backbone for access from any host within your subnet. A typical setup is shown below.*

Figure 1-7. Typical Corporate Network Configuration





## Specifications

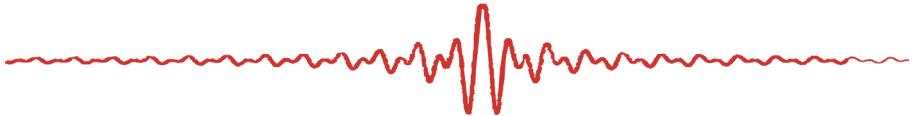
Table 1-2. EP-IR Specifications

Parameter	Value
Spectral Range MIR-I	4000 – 2000 cm-1 (2.5 – 5.0 Microns)
Grating Specifications	Holographic grating with 2x spectral range
Aperture Slit Dimensions	0.125 mm x 0.18 mm
EP-IR point Resolution	256 equidistant wavelength points across 2.5 – 5.0 Microns region
Wavenumber Precision	Better than $\pm 0.1$ cm-1 precision at 2000 cm-1
Detector	Single stage T.E. cooled PbSe
Amplifier Gain Settings	2, 4, 8, 16, 32 software selectable
ADC	Precision 16-bit
Scanning Speed	Software selectable up to 100 Hz
Signal to Noise Peak-to-Peak	(Third party determination on pre-production unit) 60 seconds $<6 \times 10^{-5}$ absorbance units (2500 – 2600 cm-1)
Operational Temperature Range	0.0 to 40° C
Power Supply	Input: 100-240V, 50-60Hz, 1.8A Output: 24V, 2.5A

Table 1-3. Sample Bench Specifications

Parameter	Value
Bench Standard	Mattson Galaxy
Accessory fitting	3.5 inch beam height
Power Supply	

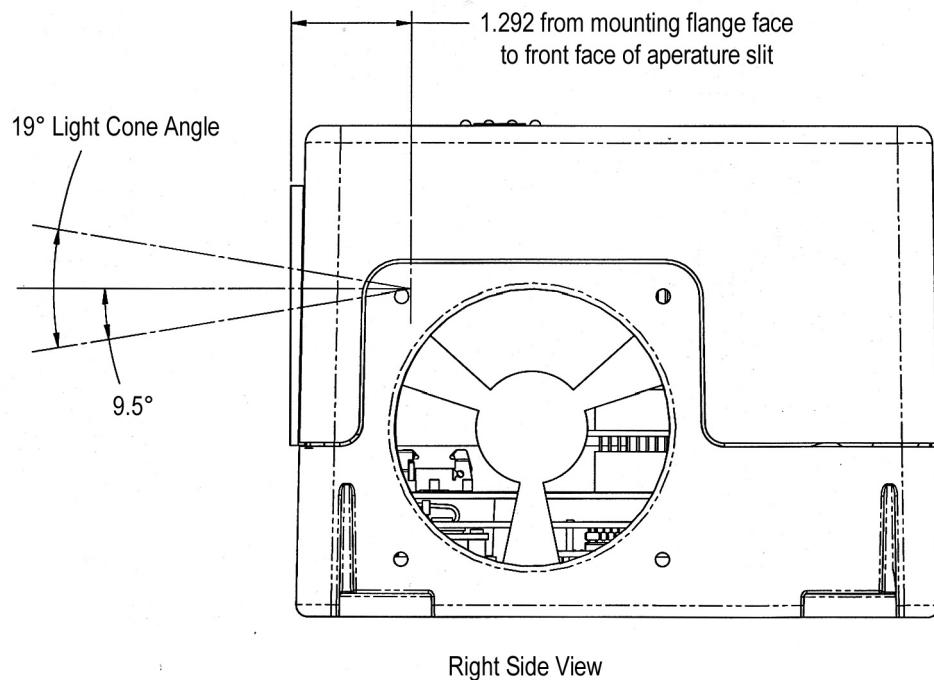
Specifications subject to change without notice.



## Instrument Dimensional Drawings

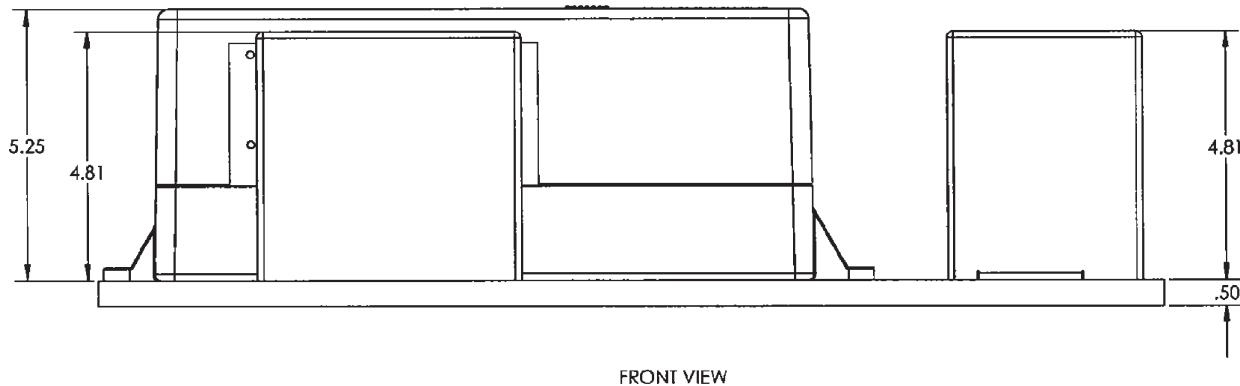
The following Figures provide alignment information for custom installation of the EP-IR. Dimensions are in inches.

Figure 1-8. Light Cone Angle and Aperature Slit Dimension



Right Side View

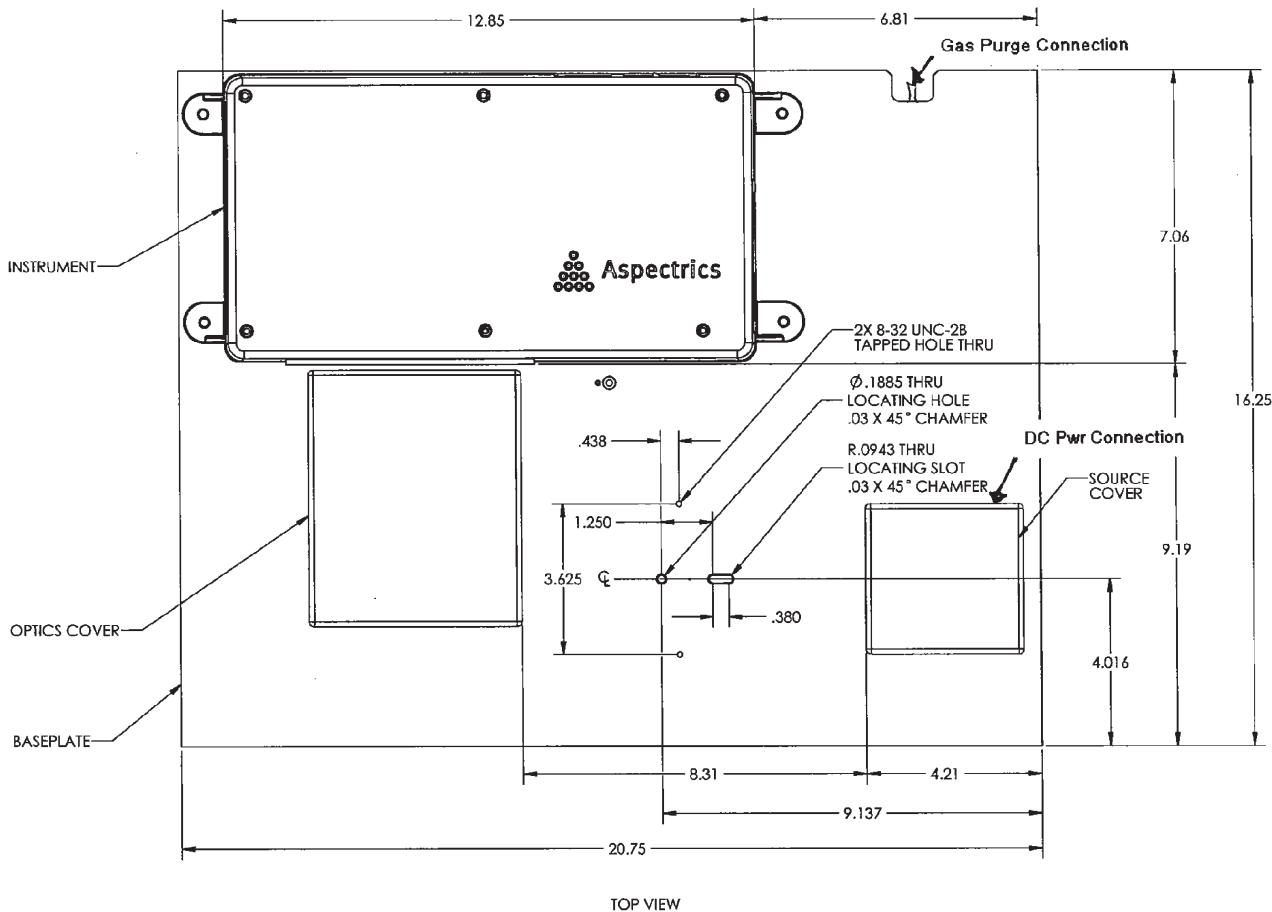
Figure 1-9. Instrument Front View Dimensions





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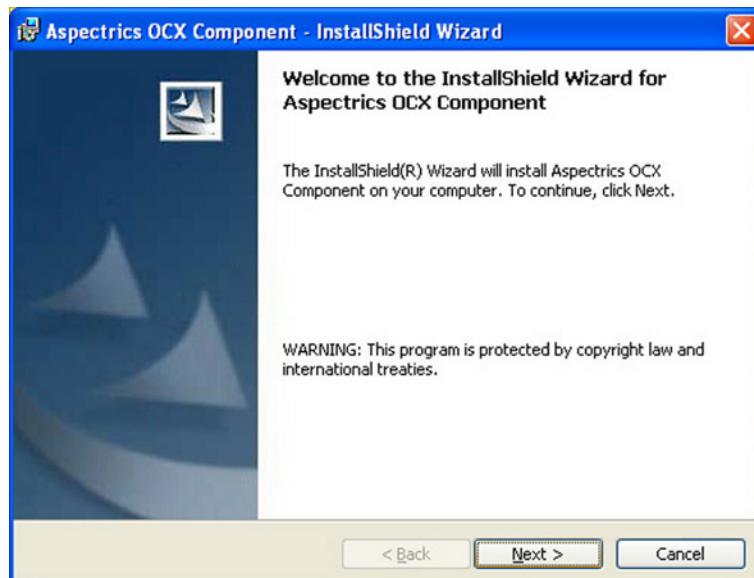
Figure 1-10. Mounting Hole Dimensions



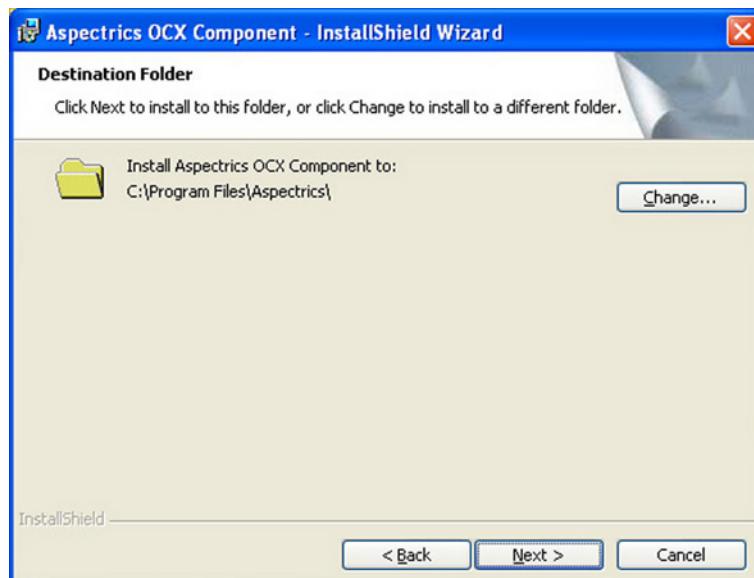


## Control Application Installation

The Aspectrics EP-IR 100 / 200 Series provides a OCX Data Collection Control system that is auto-installed from the disk included in your shipment. When you open the disk on your PC, you will see:

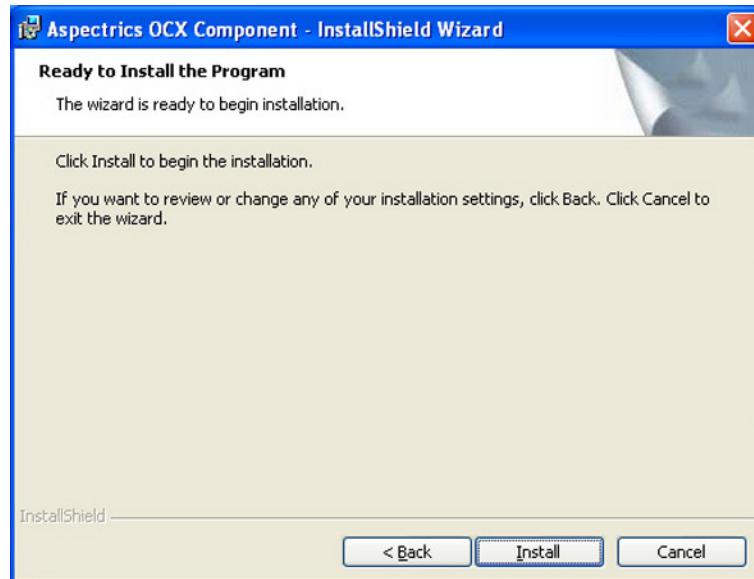


Click Next to select a location on your hard drive to install the software (default is shown).

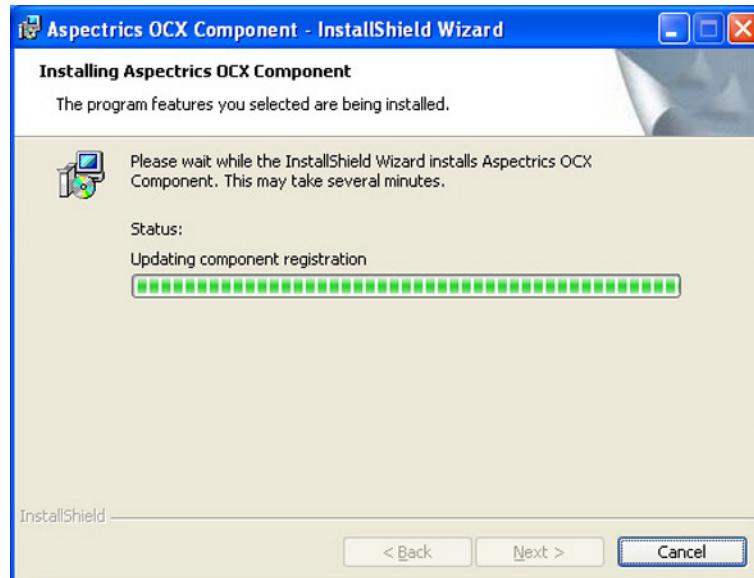




To begin the installation, click Install.

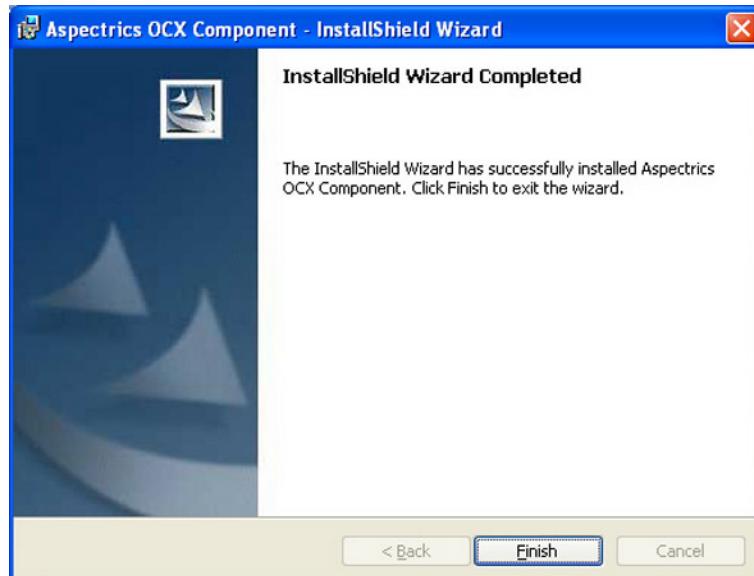


The auto-installation may take several minutes.





When installation is completed, click Finish.



## ***Initial Calibration of the EP-IR***

This procedure provides the steps for initial calibration of an EP-IR MIR-1 instrument. It is always good practice to verify with Aspectrics the latest version of the calibration procedure. Contact Aspectrics and provide the part number and version of this manual before performing initial calibration.

### ***Tools & Materials***

The following tools and materials are required or suggested for this procedure:

- An IR Light Source
- A Nitrogen Purge
- An Ethernet (RJ45) Cable
- A Computer with a network card
- The latest version of the Aspectrics OCX Software



## Calibration Procedure

The following calibration must be performed for the initial setup and every time the source-cell-system setup is changed. This procedure assumes you have completed system setup (Section 1) and have:

- Connected the system to the power supply
- Set IR Light Source
- Connected the Nitrogen purge line to the EP-IR Unit
- Connected Ethernet to a host computer with Control/Application software installed.
- Purged the unit of any unwanted gasses using N2

## Select the Instrument for Calibration

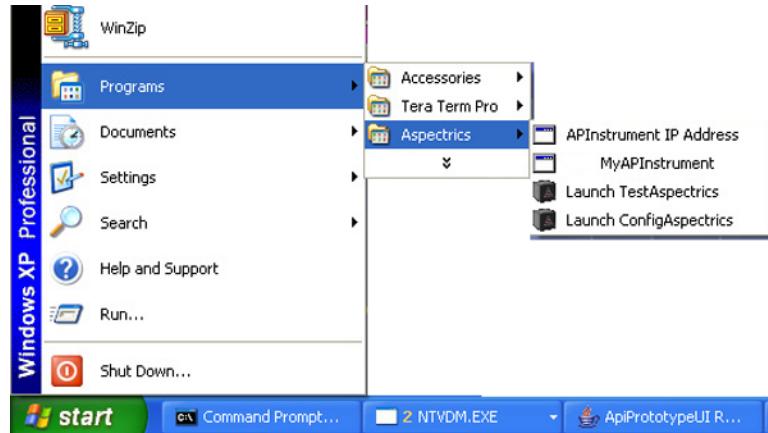
1. Open “Config Aspectrics.”
2. Enter the correct System IP number for the instrument to be calibrated.
3. Click on the “Save” button.



## Launch Calibration Software

To launch the calibration software perform the following steps:

1. Open “Launch TestAspectrics.”

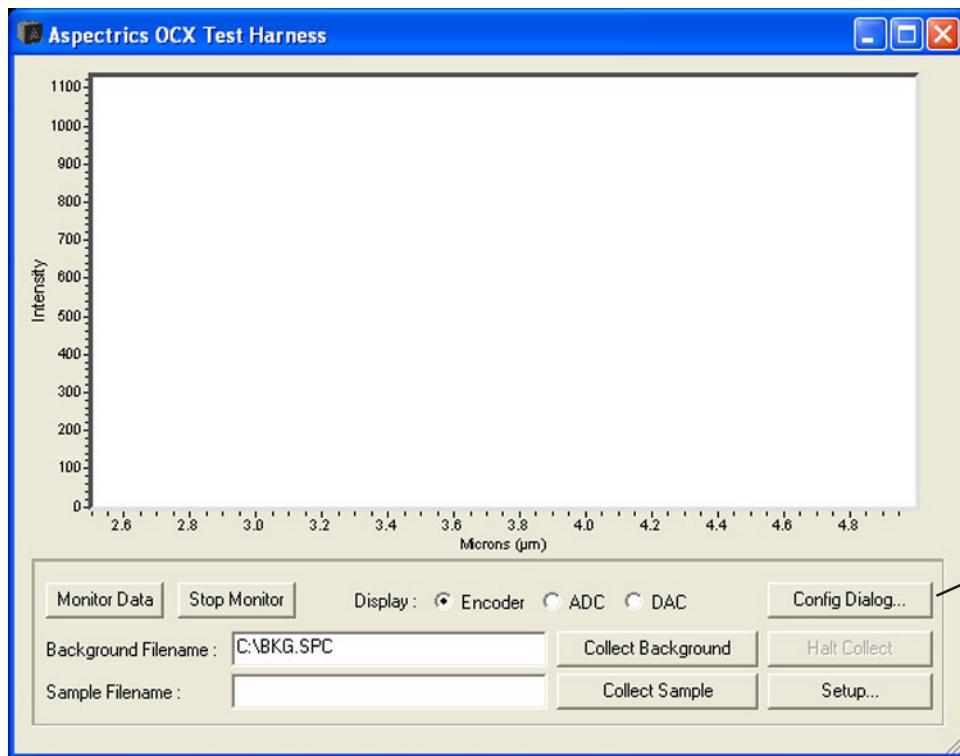




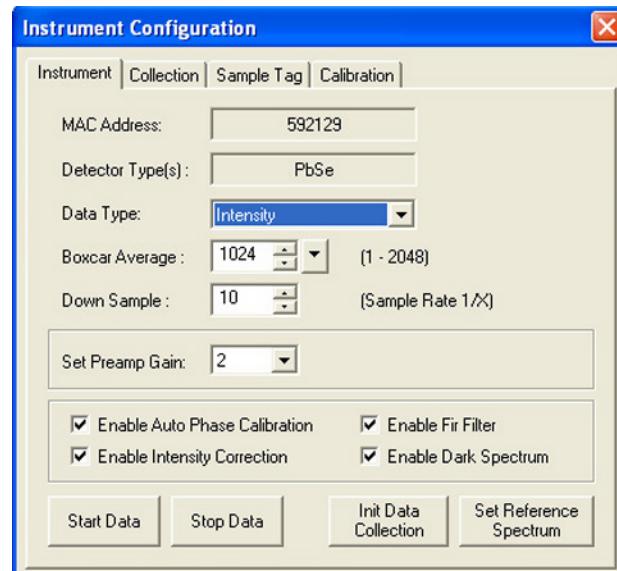
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The main window “Aspectrics OCX Test Harness” will come up.



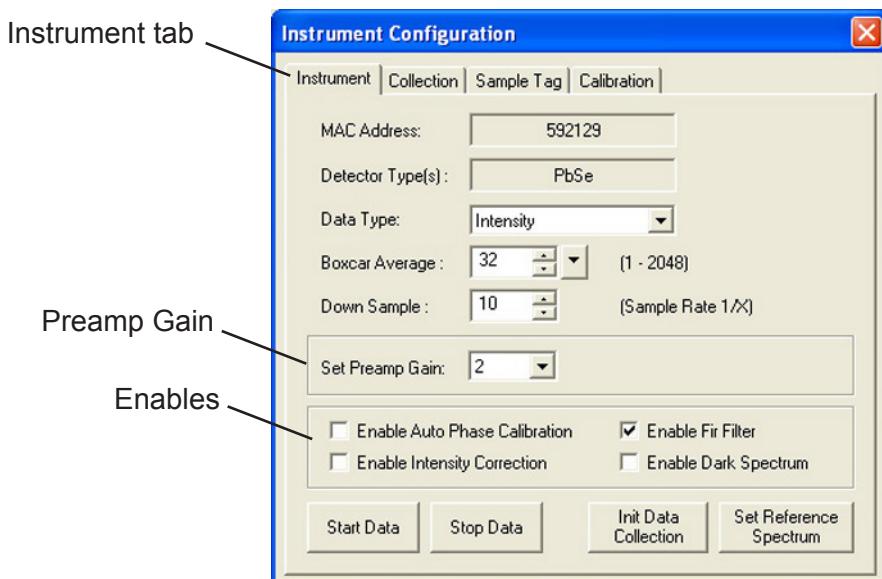
- Click on “Config Dialog” button This will bring up the “Instrument Configuration” window.





## Setup Raw Data

1. In the “Instrument Configuration” window, select the “Instrument” Tab.
2. Set the Preamp Gain to 2.

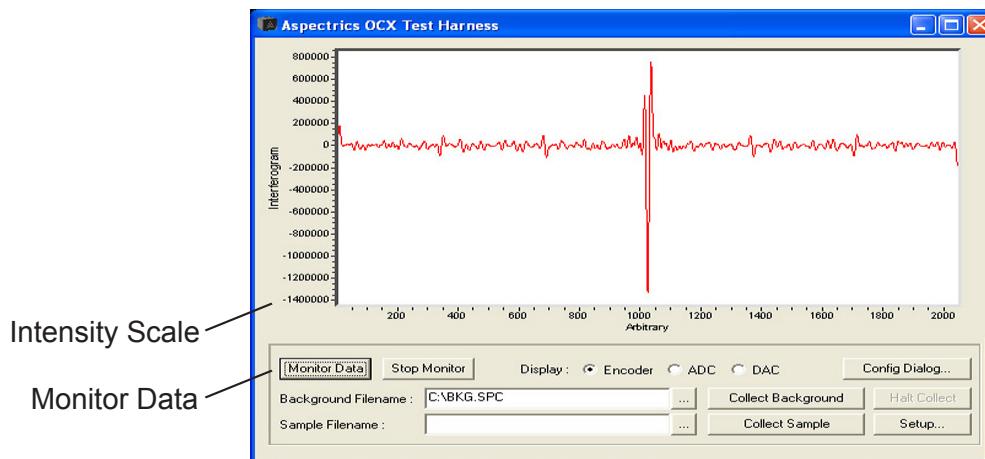


3. Deselect these three items: “Enable Intensity Correction,” “Enable Dark Spectrum,” and “Enable Auto Phase Cal.” Select “Enable Fir Filter.”

**IMPORTANT: ONLY FOR THIS PROCEDURE DO YOU DISABLE THESE ITEMS. THEY SHOULD BE ENABLED FOR NORMAL OPERATION.**

## Signal Verification – Gain

1. In the Instrument Configuration window, click on the “Monitor Data” Button. This will display a live interferogram as shown below.

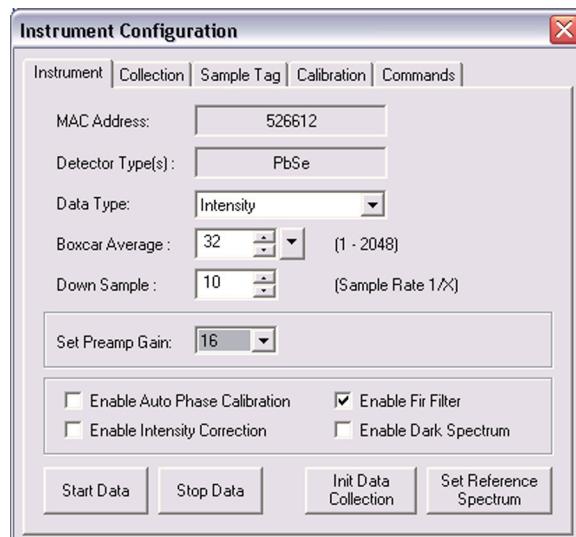




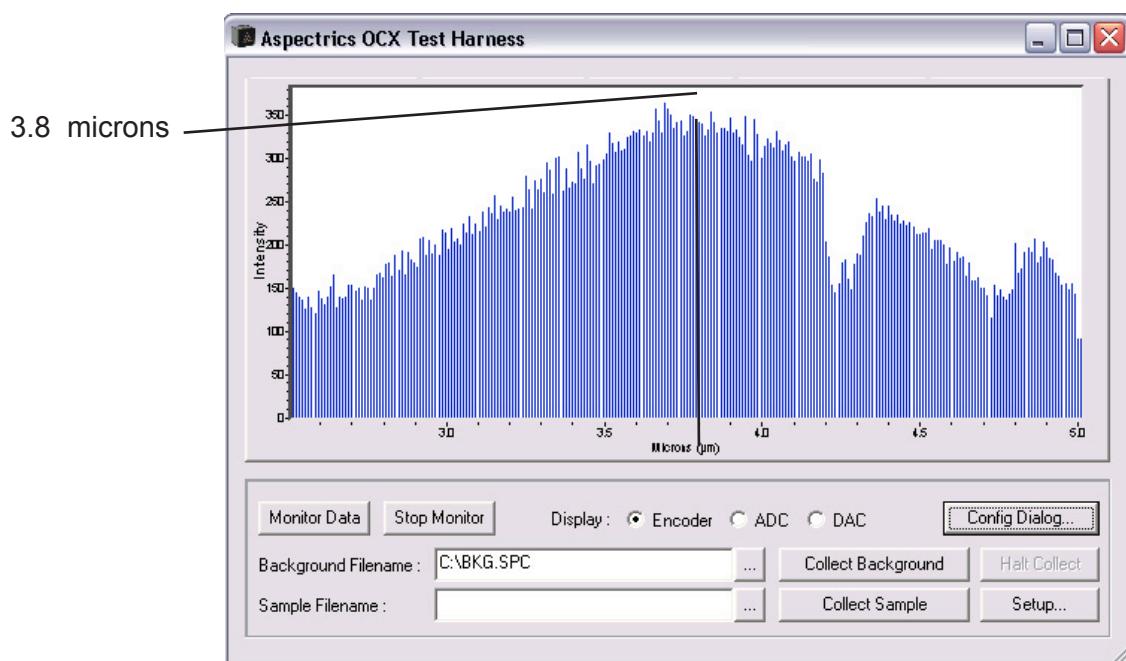
2. Check on the displayed interferogram that the gain for the detector is adjusted so the signal intensity is below two million units. If the displayed intensity is a large amount below two million, adjust the gain setting to correct it. (Correct Gain is dependent upon the source used.)

### Distribution and Purge

3. In the "Instrument Configuration" window, select the "Instrument" tab and change the Data Type to Intensity (wait 20 seconds for the display to refresh).



The maximum intensity peaks should be located at about 3.8  $\mu\text{m}$ .

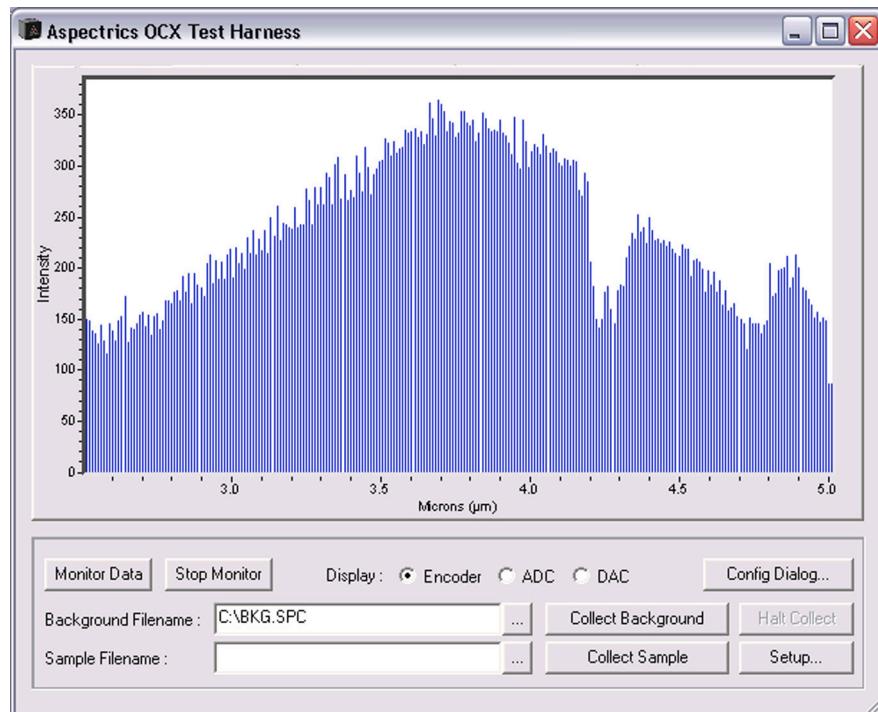




4. Verify that all unwanted gasses have been purged by looking at the intensity spectrum. The previous spectrum shows CO<sub>2</sub> emission. If not fully purged, wait for the purge to take effect.

**NOTE: IN SPECIAL CASES, IT IS POSSIBLE TO PROCEED USING AMBIENT AIR AS A PURGE GAS. THE INTENSITY SPECTRUM OF AMBIENT AIR IS SHOWN BELOW.**

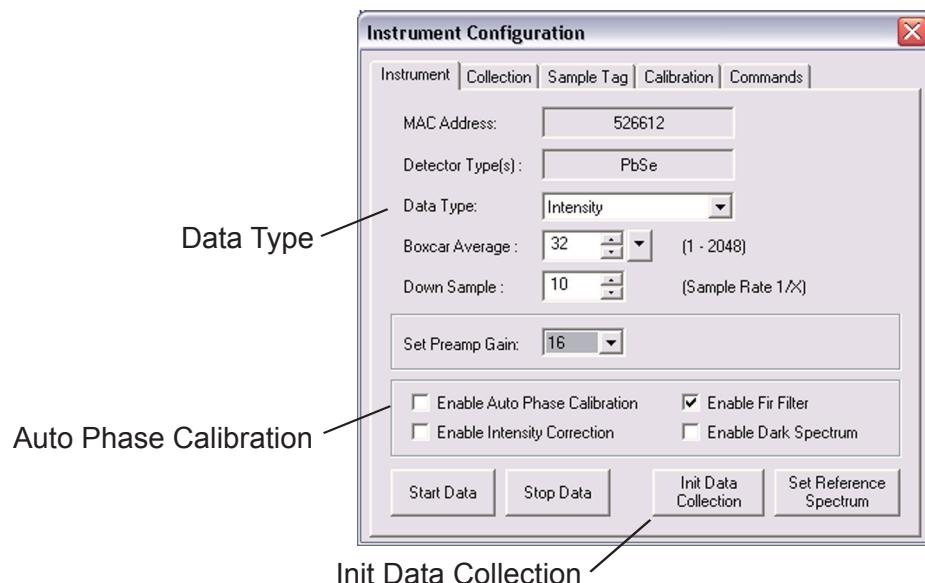
Ambient Air Intensity Spectrum



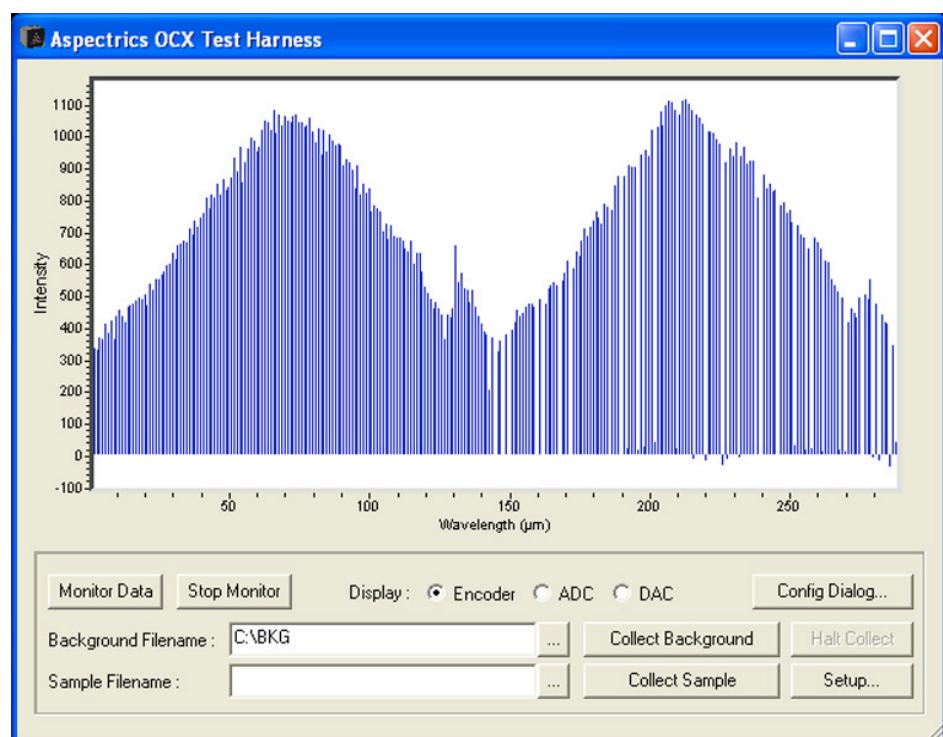


### Spectrum Verification

5. In the “Instrument Configuration” window, select the “Instrument” tab.
6. Select “Enable Auto Phase Calibration.”
7. Click on the “Init Data Collection” button.



8. In the “Instrument Configuration” window, select “Decoded” from the Data Type pull-down menu and verify the Graph is as follows (two peaks, nitrogen-purged).



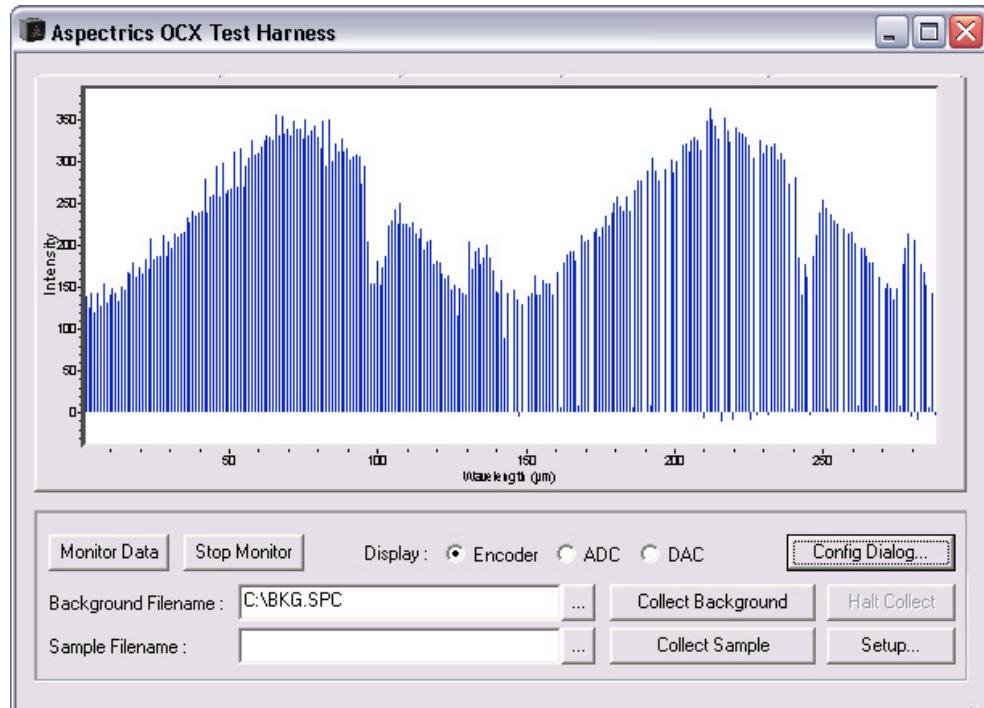


# Aspectrics



The graph shown below illustrates the Decoded spectrum in ambient air.

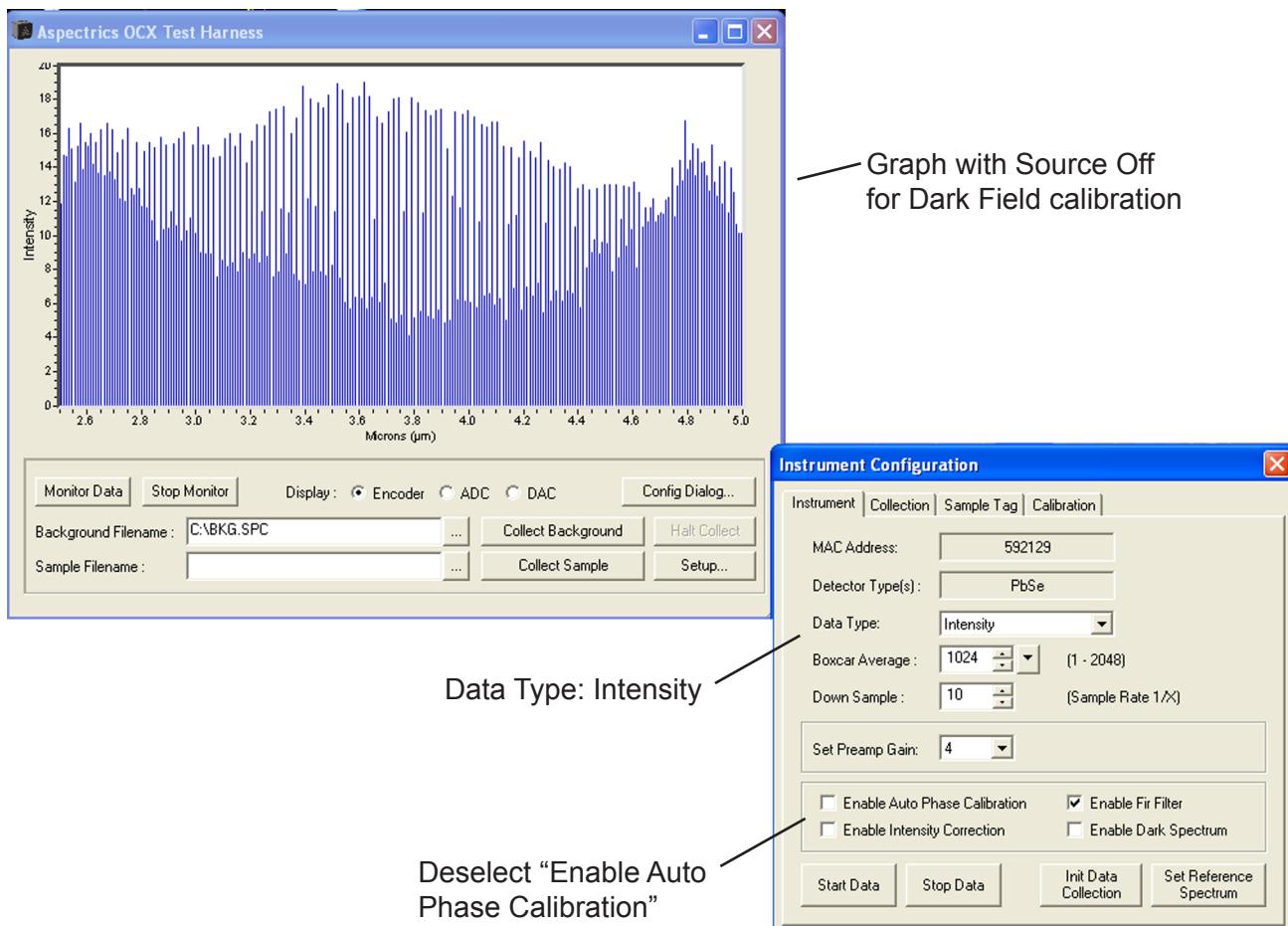
Ambient Air





## Calibrate Dark Field Spectrum

1. In the "Instrument Configuration" window, select the "Instrument" tab and deselect "Enable Auto Phase Calibration."
2. Select the Data Type "Intensity."
3. Set the Boxcar Average to "2048."
4. Remove the IR source from the unit.
5. Verify that graph shows the source is off and the signal is stabilized.

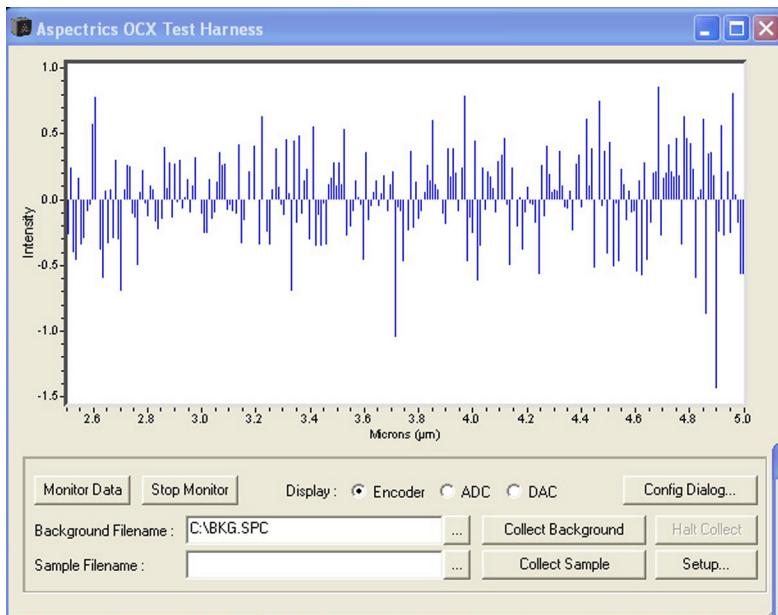




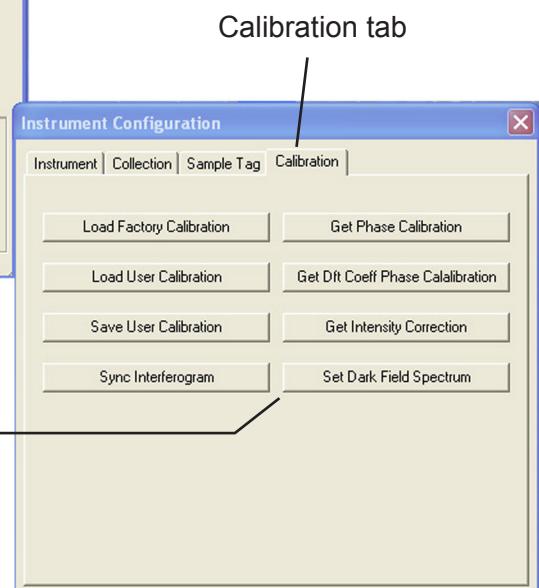
# Aspectrics



6. In the “Instrument Configuration” window, select the “Calibration” tab.
7. Select “Set Dark Field Spectrum” and verify the graph is as shown.



Graph with Dark Field Spectrum set successfully



Set Dark Field Spectrum

Calibration tab

8. Turn on or replace the IR source to the unit and wait for the signal to maximize.

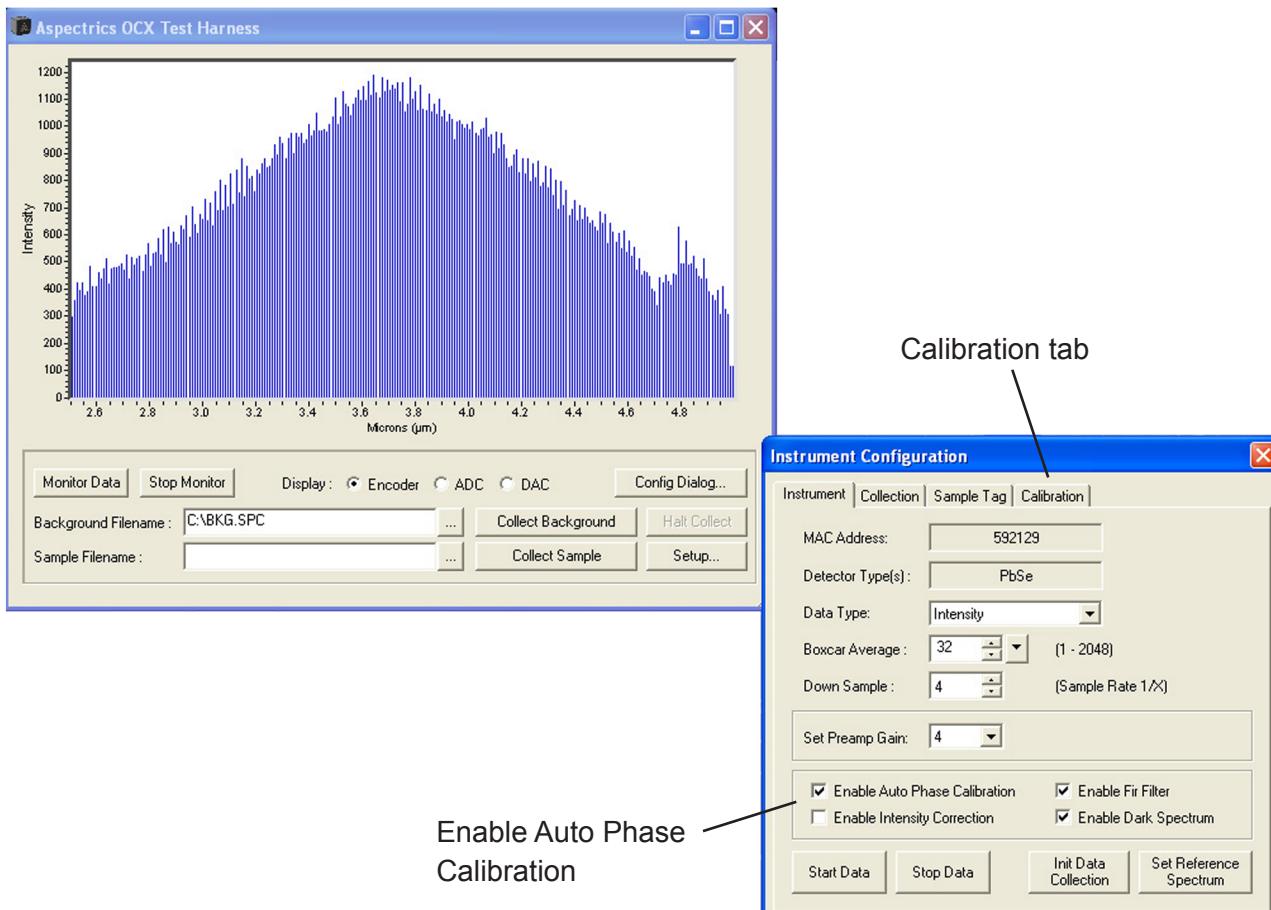


# Aspectrics

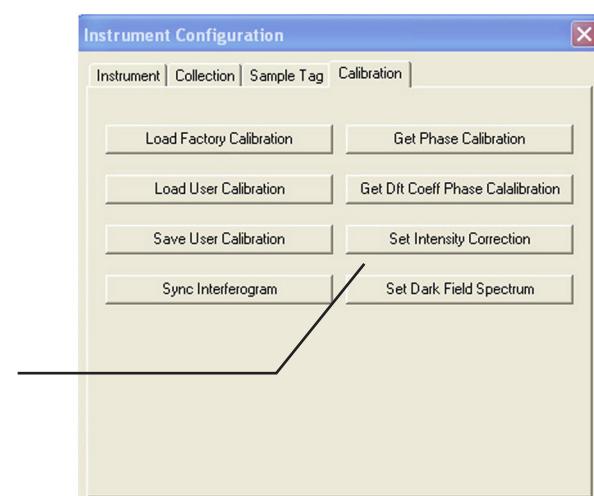


## Intensity Correction/Reference Spectrum

9. In the “Instrument Configuration” window, select the “Instrument” tab.
10. Select “Enable Auto Phase Calibration.”



11. In the “Instrument Configuration” window, select the “Calibration” tab and click on “Set Intensity Correction

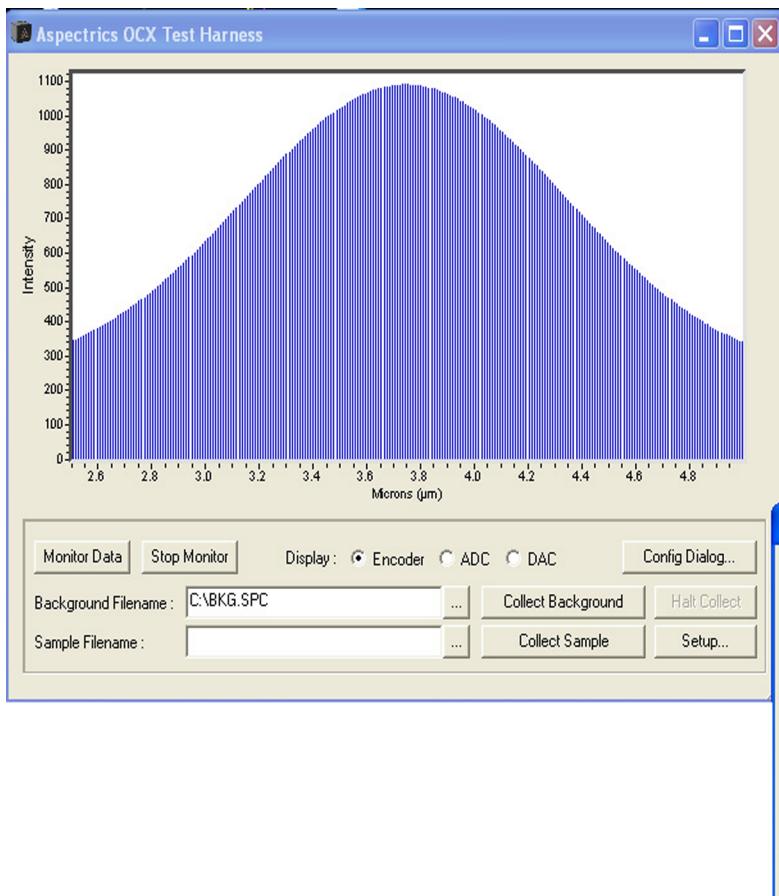




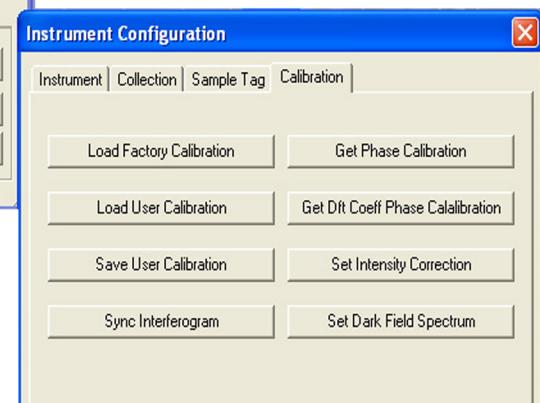
# Aspectrics



It will take approximately 20 seconds for the graph to update to produce a spectrum like that shown below.



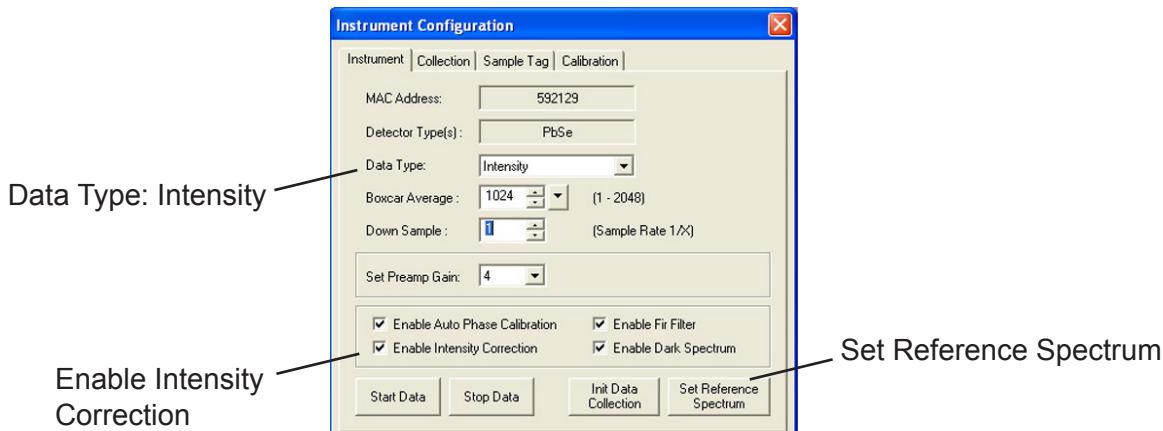
Graph after Intensity Calibration





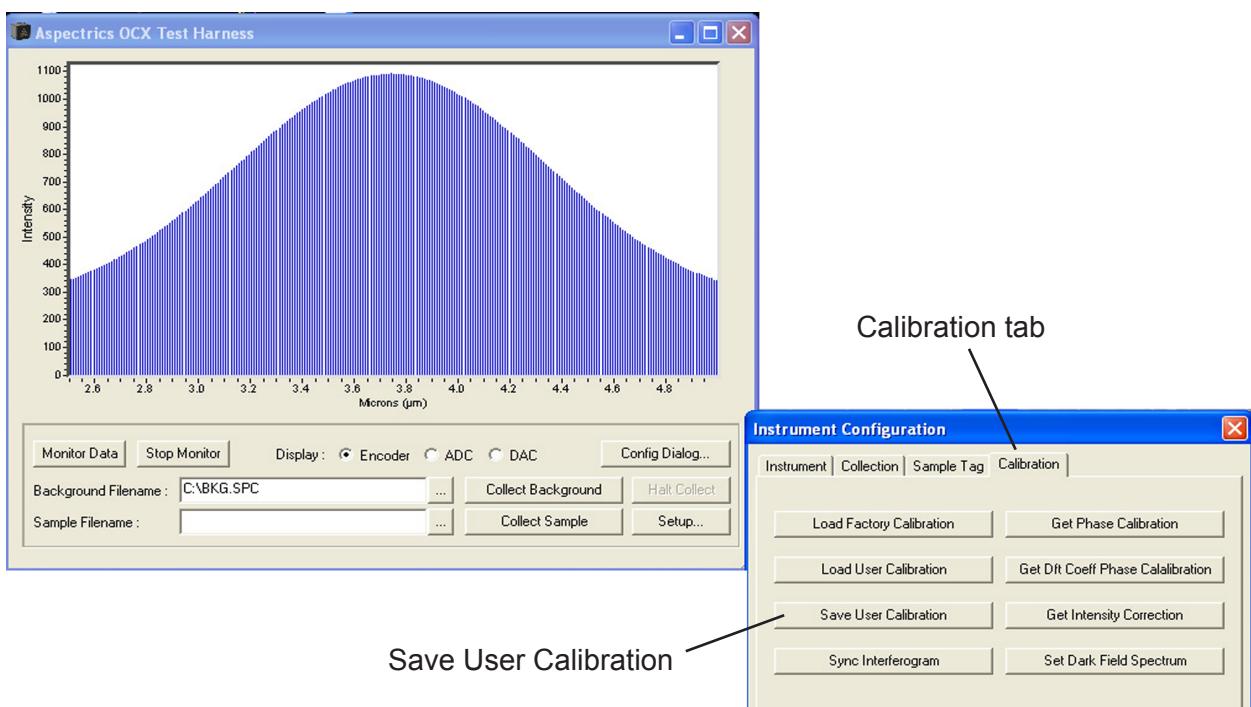
### Setting the Reference Spectrum

12. Use the “Instrument” tab to verify that “Enable Intensity Correction is selected and the graph is compares to that shown above.
13. Click on the “Set Reference Spectrum” button.



### Save Calibration

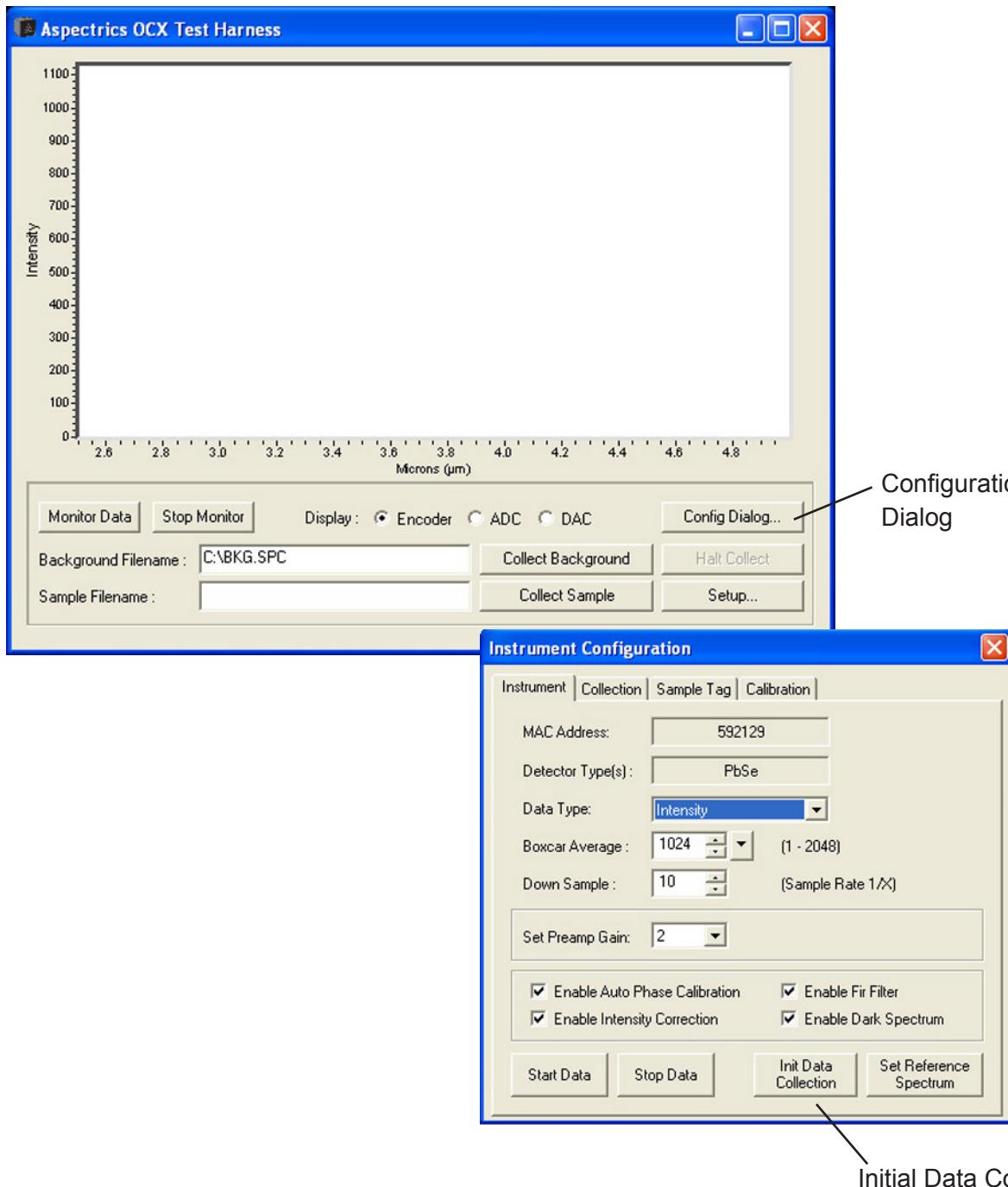
1. In the “Instrument Configuration” window, select the Calibration tab.
2. Click on “Save User Calibration” and the calibration procedure is completed.





## Data Collection

To begin data collection using the Aspectrics OCX software, launch the “MyAPInstrument” application and click on the “Config Dialog” button to bring up the “Instrument Configuration” window. Reset and ready the unit by selecting the Instrument tab and clicking on “Init Data Collection.” The “Init Data Collection” function is used whenever an alignment or parameter change has been made and a restart is required (takes approximately 20 seconds as boxcar buffer loads).

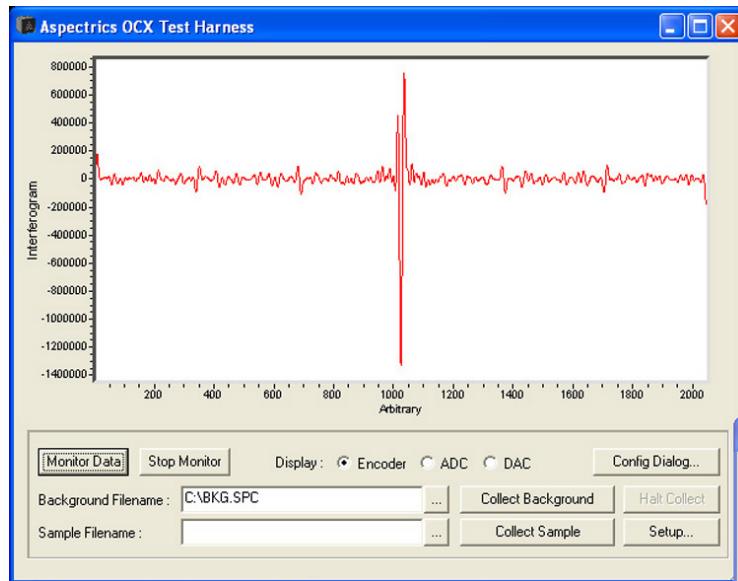




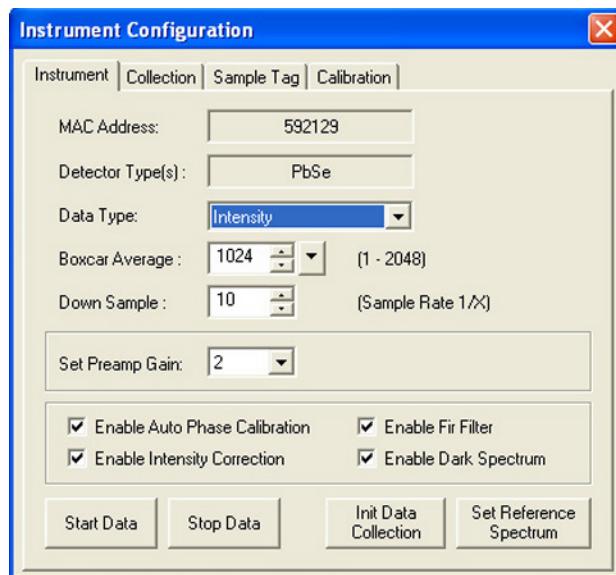
# Aspectrics



Click on the “Monitor Data” button to view a waveform.



Click on the “Config Dialog” button to view the “Instrument Configuration” window and select the Instrument tab.



Using the “Instrument Configuration” window, you can select the Data Type—the type of spectral data to return. Select from:

- Interferogram
- Decoded
- Intensity (Emittance)
- Absorbance
- Reference (required before configuring the instrument to return absorbance information)



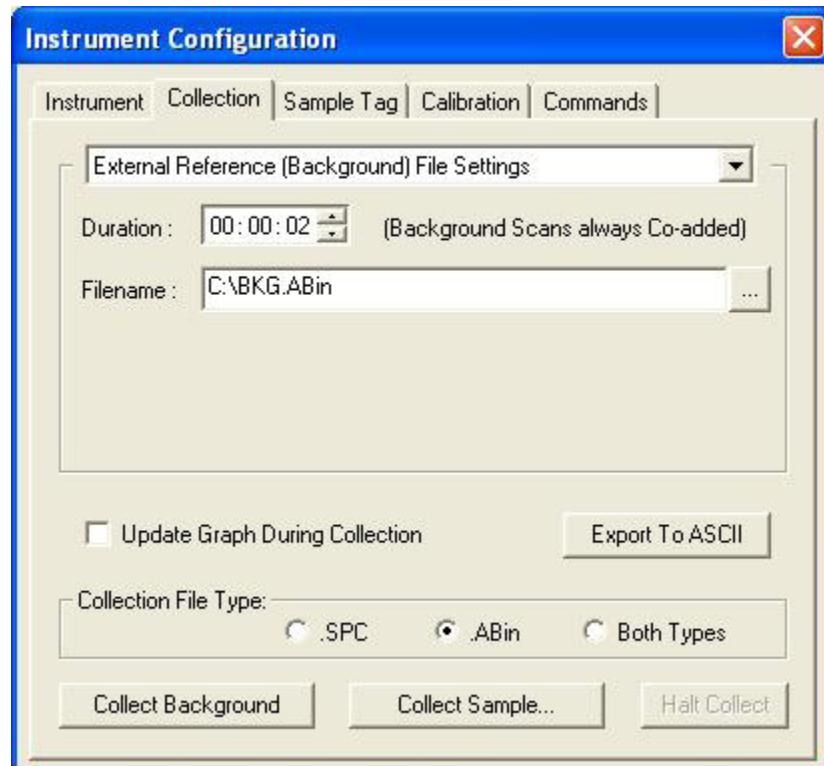
Select a Down Sample Interval – the number of data packages to be returned every second (100 = 1 frame / sec., 1 = 100 frames / sec.). Adjust the sample rate for the speed of your computer to assure complete and accurate data transfer. (Default for an interferogram is 10 and for spectral data is 4.)

Set the Boxcar Average – signal averaging process for spectral data. Input a value between 1 and 2048.

Adjust Preampl Gain to scale the display for proper signal intensity level. (Maximum of ±2 million for an interferogram, adjust to between 1 and 1.7 million.)

## Data Collection

The Collection Tab provides the functions for collecting data and exporting it in different formats. SPC (a standard spectroscopy format) and ABin formats are shown here. Other formats can be supported upon request including MATLAB & HTML / XML.



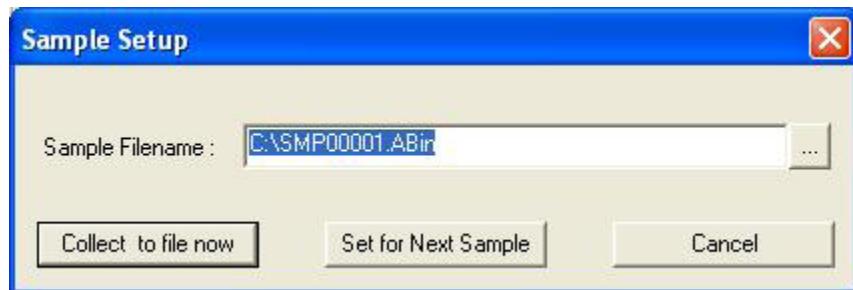
The preferred data Type for data collection is ABin (Aspectrics Binary). This native format is the most complete and compact data format available. It records every item of data that comes out of the instrument in the most compact format. From the ABin file, you can select desired types of data for immediate export and return later to extract any other captured data. The ABin file can be exported to ASCII text



for use in spreadsheet or other analysis applications.

When collecting data and exporting to a file, you will:

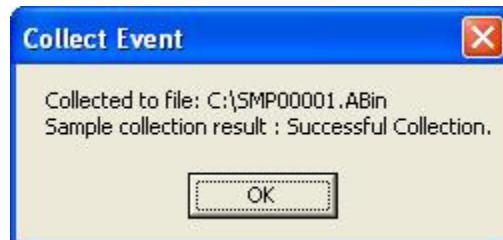
1. Click on Collect Sample – enter the directory path and file name.



If you perform more sample collections without renaming the file, the name will be stored in the same directory and automatically appended with a number (002, 003, etc.).

***NOTE: IF YOU ARE DOWNSAMPLING AT A HIGH RATE (1 = 100 FRAME /SEC.)  
YOU MAY WANT TO DESELECT "UPDATE GRAPH DURING COLLECTION." A  
SLOW COMPUTER COULD DROP SOME FRAMES IF PREOCCUPIED WITH THE LABOR  
INTENSIVE GRAPHICS UPDATE.***

2. Click on Collect to File Now to display a progress bar. At the top of the graph, a counter indicates the frame being scanned. When complete, the Collect Event window is displayed.



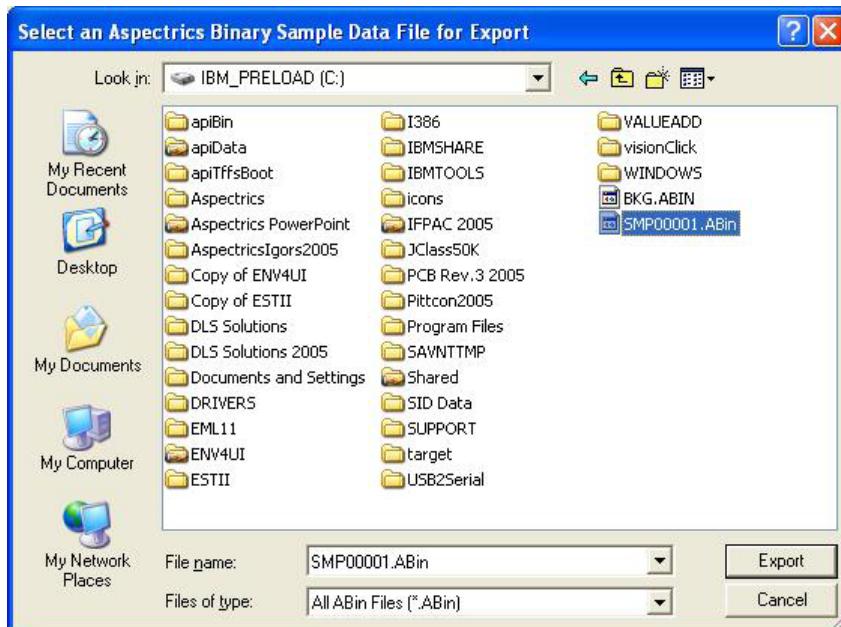
A binary file will depict the resulting data in one continuous stream. When the data is exported to ASCII, the data will display in one row per frame with data channels in columns.



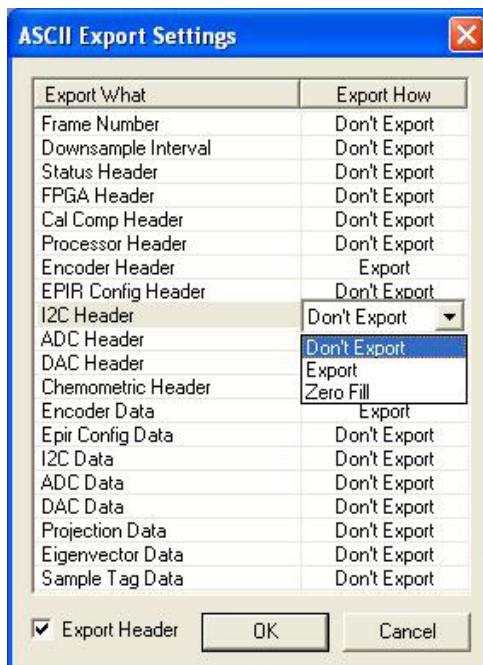
## Export to ASCII

To select specific content and format for viewing in spreadsheet or other applications, you will export the ABin file to an ASCII file.

1. Click on Export to ASCII and select the data file for export.



2. Click on Export to assemble the ASCII file. The ASCII Export Settings window appears. Click in the Export How list for the items you want included. Select from Don't Export, Export, or Zero Fill. Check or un-check the Export Header box to include or exclude header information in the file. Click on OK.





# Aspectrics



The ASCII Export Setting you make will be saved for your future exports. You can now access the directory and open the exported ASCII file using Excel or other third-party applications.

***NOTE: FILE SIZE OF THE ASCII TEXT CONVERSION, WITH ALL DATA INCLUDED,  
WOULD BE APPROXIMATELY FOUR TIMES AS LARGE AS THE ORIGINAL ABIN FILE.***



## Updating Aspectrics Software

Aspectrics provides an FTP site for downloading the latest software for the EP-IR spectrograph.

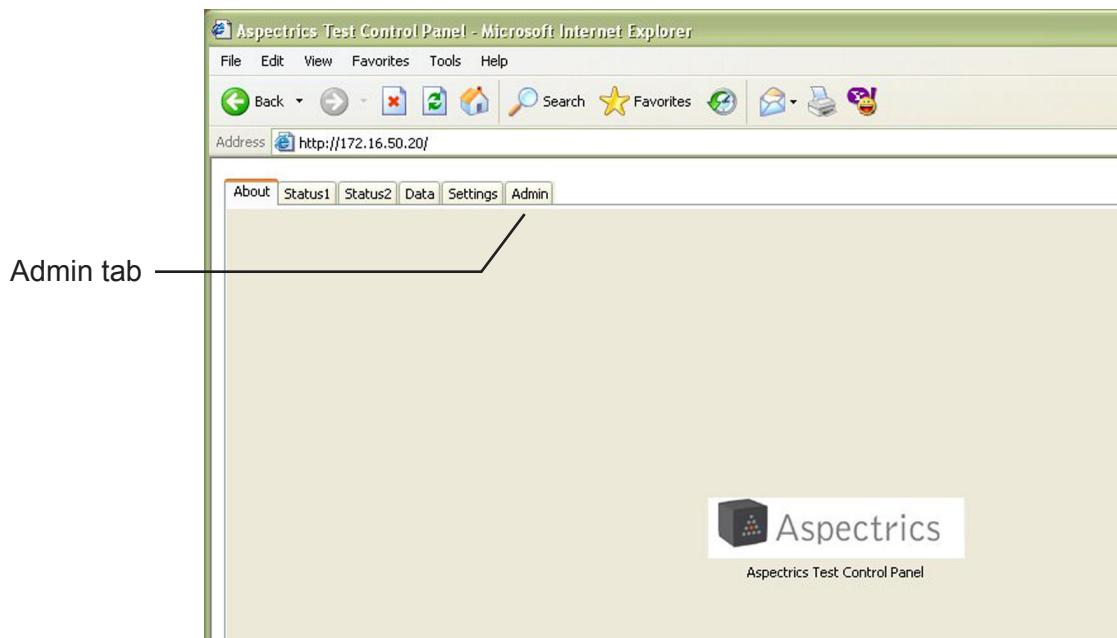
Open a browser and enter address of the EP-IR instrument in the URL field (set during installation).

A Connect window will appear. Enter the following:

- User name: admin
- Password: admin



Click OK to launch the Java applet to perform the download. The following screen will be displayed. Click on the Admin tab.





Using the “Admin” window, set the Host Address field to the Aspectrics FTP site by entering: 67.97.185.29 and click on the desired download:

- Upgrade Application – for the latest version of the Aspectrics OCX software.
- Upgrade Applet – for the latest version of the Java applet in the EP-IR instrument.
- Upgrade Web Server – for the latest embedded HTTP server application that allows your browser to connect to the instrument. It is also a gateway through which the Java applet can interact with the instrument. As such, it may need to be upgraded together with the applet depending upon the compatibility the two versions.
- Download Configuration Files – to load saved a saved configuration file from your client computer to the instrument.
- Download Calibration – to load a saved calibration file from your client computer to the instrument.

The screenshot shows the Aspectrics Test Control Panel interface in Microsoft Internet Explorer. The 'Admin' tab is active. The 'Login' section contains fields for 'Username' (admin) and 'Password'. Below it, the 'Boot Parameters' section lists various system settings. On the right, there are sections for 'Downloads' (with buttons for upgrading application, applet, web server, and configuration files) and 'Uploads' (with a field for 'Filename' containing '/tffs0/'). A 'Reboot' button is located at the bottom. The status bar at the bottom left shows 'Applet asp\_app started'.

The upgrade software will be downloaded to the instrument. When complete, click Reboot.



## ***Upgrade from a Local Server***

To Upgrade from a local server, enter the IP address of your server in the Host Address field and proceed as previously described.

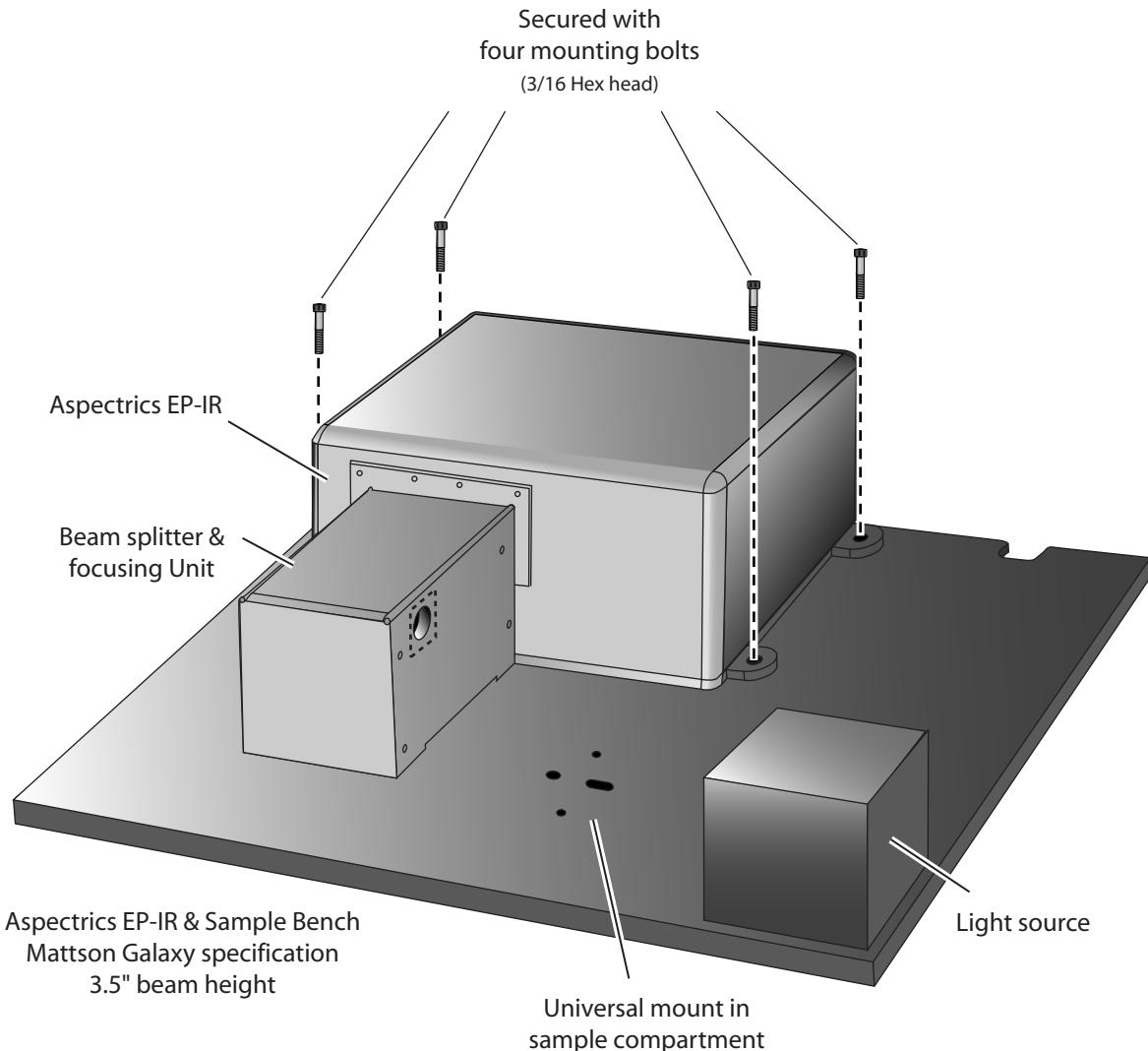


## Using the Sampling Bench Option

The Aspectrics EP-IR 100/200 Series is most often used in a laboratory environment mounted on the Sample Bench shown in **Figure 3-1**. The Sample Bench option consists of the following:

- Development Bench with beam splitter and light source.
- Power Supply Brick for light source
- Hardware assembly kit with Hex wrench

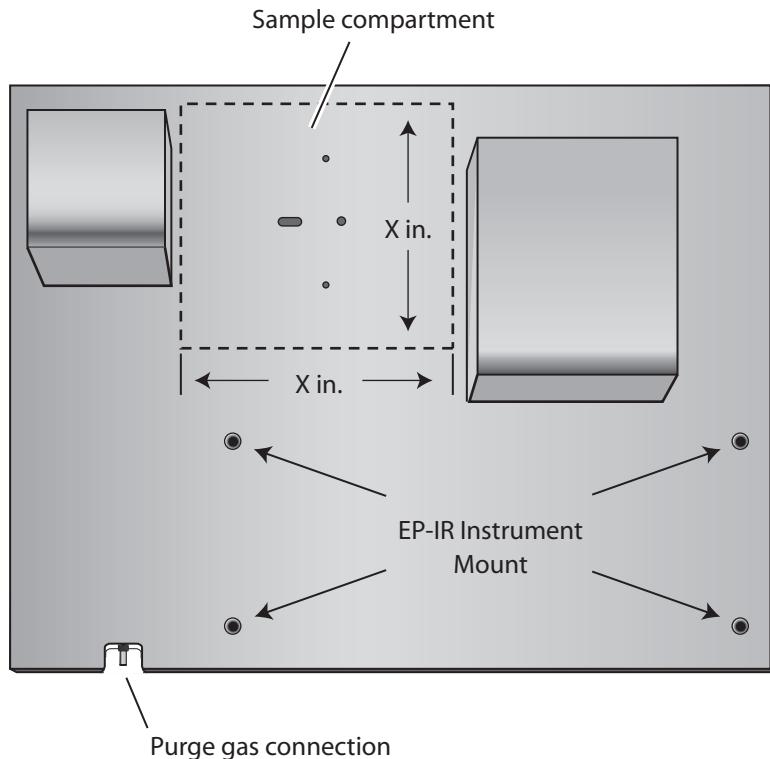
*Figure 3-1. Mounting the EP-IR on a Sample Bench*



## **Sample Bench Assembly**

Figure 3-2 shows a top view of the Sample Bench indicating mounting holes for the EP-IR Instrument and the Sample Compartment area.

*Figure 3-2. Sample Bench Layout*



## **Gas Connection**

Connect purge gas supply to the connector shown in Figure 3-2.

## **Instrument Alignment**

The mounting holes of the instrument are slotted in a horizontal direction. This allows horizontal alignment for maximum energy through the entrance aperture. No adjustment is necessary in the vertical direction.

